Introduction to HTML and CSS

Alex Sanchez and Francesc Carmona
Genetics Microbiology and Statistics Department

Universitat de Barcelona
October 2022

Outline

1) Introduction to HTML

2) Site formatting with Cascading Style Sheets (CSS)

3) References and Resources

Introduction to HTML

What is HTML

- HTML is a computer language devised to allow website creation.
- It is relatively **easy to learn**, with the basics being accessible to most people in one sitting.
- It is quite **powerful** in what it allows you to create,
- It is constantly undergoing revision and evolution
- The most recent incarnation is HTML5

General characteristics

- HTML: HyperText Markup Language
- Based on "tags", like markdown or *latex*.
- Combines power & simplicity
  - HTML documentos are text (ASCII) files.
  - HTML is (intended to be) "portable".
  - Can include links to (Hyper)text and (Hyper)media.

HTML editors

- General purpose editors:

  - Emacs, Textpad, Notepad++

- Browser-related editors

  - Kompozer,

- Specific editors

  - HoTMetaL, Quanta, Front Page

- Word processors

  - **Avoid this option**

HTML, CSS and javascript

HTML documents

- An HTML document is basically plain text that can be opened and edited with any text editor.
- HTML's power lies in its marked up structure.
- HTML markup allows defining:
  - the parts of a document that need to be displayed as headlines, - the parts that contain links,
- the parts that should be organized as tables,
- etc.

HTML elements

- The building blocks of HTML documents are HTML elements.
- "Elements" are made of text (content) enclosed between two tags.
- "Tags" are pairs of words enclosing content.
  - Words are identical but closing tag starts by "/".

```
1    <h1>This is a title</h1>
2    This is normal text
3    <p>
4    Now it is formatted as<b bold/>, <i>italics</i> or
     <b><i>both</i></b>
```

This is a title

This is normal text

Now it is formatted as, *italics* **or** *both*

HTML Tags, Elements, Atributes

HTML Tags	HTML Elements	HTML Attributes
HTML tags are used to hold the HTML element.	HTML element holds the content.	HTML attributes are used to describe the characteristic of an HTML element in detail.
HTML tag starts with < and ends with >	Whatever written within a HTML tag are HTML elements.	HTML attributes are found only in the starting tag.
HTML tags are almost like keywords where every single tag has unique meaning.	HTML elements specifies the general content.	HTML attributes specify various additional properties to the existing HTML element.

Attributes have names and values

- This is very relevant for web scraping because these are used to locate and select content.
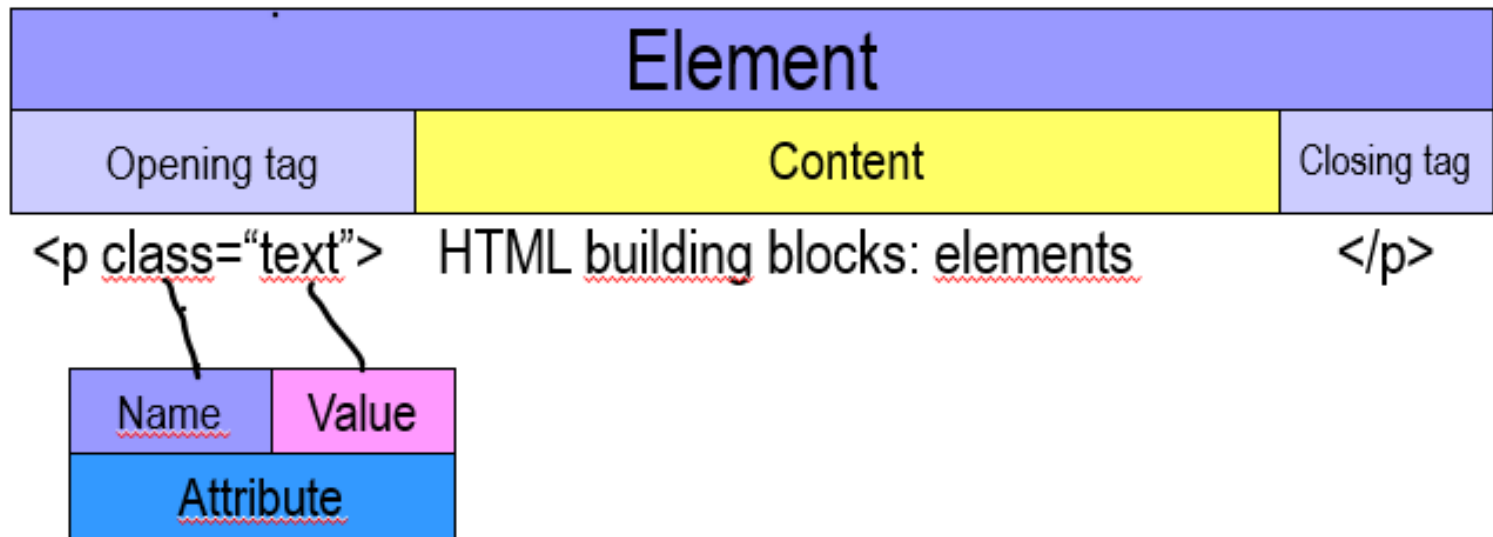
Minimal HTML Document Structure

```
1    <!DOCTYPE html>
2    <html lang="en">
3  ▼ <head>
4      <meta charset="utf-8">
5      <title>First HTML examples</title>
6    </head>
7    <body>
8    <h1>Example 1</h1>
9    <h1>This is a title</h1>
10   This is normal text
11   <p>
12   Now it is formatted as<b bold/>, <i>italics</i> or <b><i>both</i></b>
13   /body>
14   </html>
15
```

Example 1

This is a title

This is normal text

Now it is formatted as, *italics* **or** *both*

- Any HTML document is enclosed by the HTML tags
- Two compulsory sections enclosed by HEAD and BODY tags.
- All other tags are optional and depend on the content.

Ordered and unordered lists

```
1
2  ▼ <html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">
3  ▼   <head>
4        <title>Lists in HTML</title>
5      </head>
6  ▼   <body>
7        <h1>Ordered list</h1>
8  ▼     <ol>
9          <li>First</li>
10         <li>Second</li>
11         <li>Third</li>
12       </ol>
13       <h1>Unordered list</h1>
14 ▼     <ul>
15 ▼       <li>
16           Natural Sciences
17 ▼         <ul>
18             <li>Biology</li>
19             <li>Zoology</li>
20           </ul> </li> <li>
21           Social Sciences
22 ▼         <ul>
23             <li>Geography</li>
24             <li>History</li>
25           </ul>   </li>    </ul>   </body>
26   </html>
```

Ordered list

1. First
2. Second
3. Third

Unordered list

- Natural Sciences
  - Biology
  - Zoology
- Social Sciences
  - Geography
  - History

HTML Tables

```
1
2    <!DOCTYPE html>
3    <html>
4  ▼ <head>
5        <title>HTML Tables</title>
6    </head>
7  ▼ <body>
8      <h1>An HTML Table</h1>
9      <table>
10 ▼ <tr> <th>Rank</th> <th>Nominal GDP</th> <th>Name</th> </tr>
11     <tr> <th></th> <th>(per capita, USD)</th> <th></th> </tr>
12     <tr> <td>1</td> <td>170,373</td> <td>Lichtenstein</td> </tr>
13 ▼ <tr> <td>2</td> <td>167,021</td> <td>Monaco</td> </tr>
14     <tr> <td>3</td> <td>115,377</td> <td>Luxembourg</td> </tr>
15 ▼ <tr> <td>4</td> <td>98,565</td> <td>Norway</td> </tr>
16     <tr> <td>5</td> <td>92,682</td> <td>Qatar</td> </tr>
17 ▼ </table>
18   </body>
19   </html>
```

An HTML Table

Rank	Nominal GDP (per capita, USD)	Name
1	170,373	Lichtenstein
2	167,021	Monaco
3	115,377	Luxembourg
4	98,565	Norway
5	92,682	Qatar

- Most common HTML data container in web sites
- Structure is very flexible and *hierarchichal*

Hypertext and links


```
 1    <!DOCTYPE html>
 2  ▼ <html>
 3  ▼   <head>
 4        <title>HTMLExample7Hyperlinks</title>
 5      </head>
 6  ▼   <body>
 7  ▼     <ul>
 8  ▼       <li>
 9            Hyperlinks allow linking any two pages independently of their physical
10            location
11          </li>
12          <li>Link may be to pages or to some elements of a given page.</li>
13          <li>Elements in the same page can also be linked</li>
14  ▼       <li>
15            Examples:
16  ▼         <ul>
17              <li><a href="http://www.elpais.es"> Diario El País </a></li>
18              <li><a href="HTMLExample1.html"> Página1 </a></li>
19  ▼           <li>
20                <a href="http://www.ub.edu">
21                <img src="https://mat.ub.edu/departamento/wp-content/themes/matUB/images/
    logo_ub_escut.png" width="25%"
22                /></a>
23              </li> </ul> </li> </ul>
24      </body>
25    </html>
```
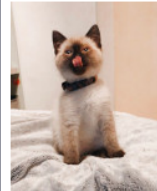
- Hyperlinks allow linking any two pages independently of their physical location
- Link may be to pages or to some elements of a given page.
- Elements in the same page can also be linked
- Examples:
  - Diario El País
  - Página1
  -

- Hyperlinks allow linking any two pages independently of their physical location
- Link may be to pages or to some elements of a given page.

Images
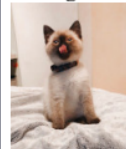
- HTML: text files, not admiting *copy and paste* images.
- Images are inserted *(linked)* from graphical files.

HTML grouping tags: DIV & SPAN

```
1   <!DOCTYPE html >
2   <html lang="en">
3
4 ▼ <head>
5      <title>DIV and SPAN</title>
6      <meta http-equiv="content-type" content="text/html;charset=utf-8" />
7   </head>
8   <body>
9   <h1> The  DIV  tag </h1>
10   The  DIV  tag defines a division or a section in an HTML document.<br>
11   In the example,  DIV  is used to create a section in a document <br>
12   that will have a light blue background color:
13 ▼ <div style="background-color:lightblue">
14      <h3>This is a heading</h3>
15      <p>This is a paragraph.</p>
16   </div>
17   <h1> The  SPAN  tag </h1>
18   The SPAN tag is used to group inline-elements in a document.<br>
19   The  SPAN  tag provides no visual change by itself.<br>
20   The  SPAN  tag provides a way to add a hook to a part of a text or a part of a document.<br>
21   In the example, SPAN  is used to change the color of a single word in a heading:
22   <h3>My mother has <span style="color:blue">blue</span> eyes.</h3>
23   </body>
24   </html>
```

The DIV tag

The DIV tag defines a division or a section in an HTML document.
In the example, DIV is used to create a section in a document
that will have a light blue background color:

This is a heading

This is a paragraph.

The SPAN tag

The SPAN tag is used to group inline-elements in a document.
The SPAN tag provides no visual change by itself.
The SPAN tag provides a way to add a hook to a part of a text or a part of a document.
In the example, SPAN is used to change the color of a single word in a heading:

My mother has blue eyes.

- DIV defines *block-level* section HTML elements container.
- SPAN defines *inline* sections: Text container.
- No required attributes but may use *style* , *class* or *id*.

HTML cheatsheet

HTML CHEAT SHEET

*
 empty tags

DOCUMENT OUTLINE

`<!DOCTYPE>`	Version of html
`<html>`	HTML document
`<head>`	Page information
`<body>`	Page documents

COMMENTS

`<!--comment text-->`

PAGE INFORMATION

`<base/>`	Base URL
`<meta/>`	Meta data
`<title>`	Title
`<link/>`	Relevant resource
`<style>`	Style resource
`<script>`	Script esource

LISTS

`<ol>`	Ordered list
`<ul>`	Unordered list
`<li>`	List item
`<dl>`	Definition list
`<dt>`	Definition term
`<dd>`	Term description

DOCUMENT STRUCTURE

`<h[1-6]>`	Heading
`<div>`	Page section
`<span>`	Inline section
`<p>`	Paragraph
` `	Line break
`<hr/>`	Horizontal rule

LINKS

`<a href="">`	Page link
`<a href="mailto:">`	Email link
`<a href="name">`	Anchor
`<a href="#name">`	Link to anchor

TABLES

`<table>`	Table
`<caption>`	Caption
`<thead>`	Table header
`<tbody>`	Table body
`<tfoot>`	Table footer
`<colgroup>`	Column group
`<col/>`	Column
`<tr>`	Table row
`<th>`	Header cell
`<td>`	Table cell

IMAGES AND IMAGE MAPS

`<img/>`	Image
`<map>`	Image map
`<area/>`	Area of image map

TEXT MARKUP

`<strong>`	Strong emphasis
`<em>`	Empahasis
`<blockquote>`	Long quotation
`<q>`	Short quotation
`<abbr>`	Abrreviation
`<acronym>`	Acronym
`<address>`	Address
`<pre>`	Pre-formatted text
`<dfn>`	Definition
`<code>`	Code
`<cite>`	Citation
`<del>`	Deleted text
`<ins>`	Inserted text
`<sub>`	Subscript
`<sup>`	Superscript
`<bdo>`	Text direction

FORMS

`<form>`	Form
`<fieldset>`	Collection of fields
`<legend>`	Form legend
`<label>`	Input label
`<input/>`	Form input
`<select>`	Drop-down box
`<optgroup>`	Group of options
`<option>`	Drop-down options
`<textarea>`	Large text input
`<button>`	Button

CORE ATTRIBUTES

| `class` | style |
| `id` | title |

Exercise

- Select a topic you feel comfortable with.
- Write or get a text that is organized in, at least two or three sections.
- Allow the code to have all the elements we have learnt about: text, tables, images, hyperlinks...
- **optional** Organize it in linked sections
    - Build a table of contents using an ordered list, where
    - each element links to each section's title.
    - Give each sections a title with headings of same type
    - Name each title to make it linkable.
    - End each section with a link to the table of contents followed by a horizontal bar.

Site formating with Cascading Style Sheets

Cascading Style Sheets

- HTML pages can look fairly plain, with default fonts/sizes.

  - Aspect can be improved with some tags/attributes,
  - It is hard to keep sinchrony in multiple-pagesd sites.

- Using CSS, it is much easier to change the aspect

  - add color and background images, borders around areas,
  - changing fonts and font sizes,
  - even changing the layout of the page itself.

- Most importantly changes can be applied to all pages allowing for easy maintenance of a site.

What is CSS

- A CSS is *a set of rules*
- Each rule is formed by:
  - The *Selector* (style name)
  - Declaration (defines the style)
  - Property
  - Value
- With CSS we can
  - Redefine HTML tag styles
  - Create personalized styles for generic use ("Classes")
  - Create styles for a specific HTML tag

```
h2  {
   text-align: center;
   color: blue;
   font: italic large "Times New Roman", serif;
}
.highlightedText{
   font-family: Arial, Helvetica, sans-serif;
   font-size: 12px;
   font-style: normal;
   font-weight: bold
   color: #000000;
}
#logo {
   background-image: url("/img/logo.gif");
   background-position:center;
   background-repeat:no-repeat;
   height: 50px; width: 150px;
   position: absolute; left: 0px; top: 0px;
```

Separating content from presentation

Without CSS

Formats are set as tag attributes

```
<h2 align="center">
    <font color="blue" size="3"
    face="Times New Roman, serif">
            <i>Web programming</i>
    </font> |
</h2>
```

With CSS

Define a new h2 format in a separate style sheet:

```
<style type="text/css">
    h2 {
            text-align: center;
            color: blue;
            font: italic large "Times New Roman", serif;
    }
</style type="text/css">
```

Automatically applied to your header

```
<h2 > Web programming </h2>
```

CSS Syntax

CSS syntax is made up of 5 parts:

1. Selector
2. Property / Value
3. Declaration
4. Declaration block
5. Curly braces

Selectors

- Selectors are used to declare which part of the markup a style applies to, a kind of match expression.

- There are 3 types of selectors

  - *Type* selectors (body, p, div, a): Redefine existing tags
  - *Class* selectors (.content, .menu): Define new tags
  - *ID* selectors (#wrapper,...): Create and name a new tag

- The selector is normally the HTML element you want to style

- Selectors should never start with a number, nor should they have spaces in them

Tag selectors

Target elements by their element type

```
span{background-color: skyblue;}

<span>Here's a span with some
text </span>

<p>Here's a p with some text
</p>
```

CSS
```
div { ... }
```

HTML
```
<div>...</div>
<div>...</div>
```

Class selectors

Allow selecting an element based on the element's class attribute value.

```
.center {text-align:center;}
p.center {text-align:left;}

<h1 class="center">Center-aligned
heading</h1>
<p class="center">Center-aligned
paragraph.</p>
<p class="left">Center-aligned
paragraph.</p>
```

CSS
```
.awesome { ... }
```

HTML
```
<div class="awesome">...</div>
```

ID selectors

More precise than class selectors, as they target only one unique element at a time

```
#wrapper
{text-align:center;
border:1px solid red;
Width: 200px;
Height: 100px
}
<div id="wrapper">… </div>
```

CSS
```
#anacidre { ... }
```

HTML
```
<div id="anacidre">...</div>
```

The difference between an ID and a class:

- an ID can be used to identify **one element**, whereas
- a class can be used to identify **more than one**.

How CSS styles are used

✓ *Inline Styles*

Use the "style" attribute to redefine an HTML element individually.

```
<h2 style="color: blue; background: green;">
    GIE Mod. 2. Web Programming
</h2>
```

✓ *Embedded Style*

Define CSS rule from within an HTML document.

It can be applied to any element **in this document.**

```
<head>
    <style type="text/css">
        h2 {
                font-style: italic;
                font-weight: bold;
                color: blue;
        }
    </style>
</head>
<body>
    <h2> GIE Mod. 2. Web Programming</h2>
</body>
```

✓ *External Style Sheets*

Independent CSS files which one references from the HTML documents that are being used

```
<head>
<link rel=stylesheet type="text/css" href="estilos.css">
</head>
```

An exemple CSS file

```css
/* Applies to the entire body of the HTML document (except where overridden by more specific
selectors). */
body {
  margin: 25px;
  background-color: rgb(240,240,240);
  font-family: arial, sans-serif;
  font-size: 14px;
}


/* Applies to all <h1>...</h1> elements. */
h1 {
  font-size: 35px;
  font-weight: normal;
  margin-top: 5px;
}


/* Applies to all elements with <... class="someclass"> specified. */
.someclass { color: red; }


/* Applies to the element with <... id="someid"> specified. */
#someid { color: green; }
```

Original file in this link

A CSS cheatsheet

Exercise

- Assuming you have created a basic web site with, at least two pages, create a CSS file that modifies, at least :
  - Color, font and text properties
  - Affecting to general elements such as the body
  - and particular ones such as headings
- Link that CSS to all pages in the site
- Create a new CSS file by making some changes to the first one.
- Link each file to a different page
- Link both CSS to one of the pages. See the effects of cascading.

References and Resources

Resources

- W3school.com

- CodeAcademy

  - https://www.codecademy.com/catalog/subject/web-development

- A CSS file example

  - https://docs.fileformat.com/web/css/

- Google, of course.